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The Citrus Industry

THE ONLY PUBLICATION IN THE WORLD
DEVOTED EXCLUSIVELY TO CITRUS FRUITS

Issued Monthly
Representative of every interest—
Representing no special interest

Vol. 2 No. 8

TAMPA, FLA., AUGUST, 1921

15 Cents a Copy



The American Fruit Growers Inc., is the most distinctively constructive factor in the fruit industry.

Progressive and alert, ready to embrace every practical suggestion for improvement, it holds itself free from all narrow prejudices, and bends all its energies toward the general advancement of the best interests of the entire industry, by the inauguration and consistent application of correct principles and methods in the handling of fine fruits.

It recognizes that its own and the grower's greatest success are inseparable. It has a correct understanding of the grower's problems and of the problems of successful packing and marketing, and it possesses the necessary organization, facilities and experience for meeting and solving these problems with maximum efficiency.

Its entire program is a Constructive Program and offers distinct advantages to every producer of high class products.

American Fruit Growers Inc.



Dr. J. Petersen
Soil Chemist, Miami, Florida

A Florida Soil Chemist

By Geo. T. Tippin.

I was very much pleased when the editor of The Citrus Industry commissioned me to make a trip to the Magic City for the purpose of writing an article concerning its horticultural activities. I arrived in Miami Monday morning, July 11, and immediately sought the office of the Co-Operative Fertilizer Co., the name of whose soil chemist, Dr. J. Petersen, is a household word, not alone in that city but in all of the Southern section of the state.

Upon asking for Dr. Petersen, I was immediately ushered into his private office, and upon presenting my card to the Doctor was most heartily received. His handshake denoted a multitude of words. The favorable impression one gathers at first sight is borne out fully after more intimate acquaintanceship.

Dr. Petersen is a man just about passing his fortieth year, five feet eight inches in height, weighs about two hundred and ten pounds, carries always a smiling countenance, and two big blue eyes which pierce through everything.

I explained to the Doctor the purpose of my visit and he at once told me that I would have his full support in everything that this publication would undertake for the improvement of horticultural matters in this state, and during my stay of one week he gave ample testimony of the sincerity of his pledge. There was no request that I made which was not immediately granted, besides a hundred and one things which he did of his own accord in the spirit of public interest and with no thought of himself.

It would be impossible in this short space to relate all of the things worth while that it was my pleasure to experience as the guest of Dr. Petersen, and therefore I will tell of but one phase of my trip—the one which most vividly impressed me because it is most beneficial to growers.

Dr. Petersen is a powerful human dynamo, continually on the move, and with each accomplishment he seems to be imbued with increased vitality. He is an indefatigable worker, and done wonders when he finds time to sleep. In addition to his office, literary, laboratory and other work, he spends fully as much time each day in the inspection of groves and advising with owners as

most men spend in an entire day's work.

I made several trips with Dr. Petersen to different sections of Dade county, and it was indeed a treat. Wherever he made his appearance he was met with a wholeheartedness which attested the esteem in which he is held by the growers among whom he is so well known.

One of the most interesting of our visits was to the grove of Mr. B. C. Dupont, where we were received with marked hospitality by the aged owner, a man of four score years. Mr. Dupont kindly offered to show me through his grove, an invitation which I gladly accepted. This grove proved to be one of the finest examples of scientific treatment and cultivation that I have seen. Each tree is a picture, covered with heavy foliage and bearing fruit in such quantities that one wonders that the trees do not break under their load. I did not hesitate to tell Mr. Dupont of my delight in the opportunity afforded me of inspecting his property and that I was positive that few groves could be found which would compare favorably with it.

This statement brought forth a long and hearty laugh from the old gentleman.

"Why," he said, "friend, do you realize that a year and a half ago this grove was the most pitiful looking one in all of Dade county? I had given up all hope of ever rejuvenating it to any extent whatever. I had tried everything possible. I had followed all kinds of advice and had used every kind of fertilizer imaginable, but the trees simply did not respond. I was mightily discouraged and ready to sacrifice the place for anything I could have gotten for it.

"Just at this time, when I was utterly discouraged, Dr. Petersen, the soil chemist, called on me and informed me that he had heard about my grove and had called to inquire if he could not be of some service to me. I was impressed with his sincerity, and while I did not believe that it was possible to bring the grove back into bearing, I told him that he was welcome to try.

"We tramped through the grove from tree to tree, each being carefully inspected, many times with the aid of a magnifying glass. From several the Doctor took pieces of bark, from others he broke twigs, and from some

sections of the grove he took samples of soil. The Doctor then left with the assurance that I would hear from him later.

"Ten days later I received a very bulky envelope by mail and at a glance I saw that it was from Dr. Petersen. It contained a detailed report concerning the condition of my grove. It must have taken a tremendous amount of work to complete such a report, and I do not know how it could have been done in so short a space of time. While I did not understand the scientific terms used in explaining the ailment of this or that tree, or of the condition of the soil, I did understand the specific instructions relative to the treatment and cultivation of the grove, as well as that he said that the condition of the soil could easily be remedied by making the life of the soil bacteria a merry one, and he told me that if I would do this I would have an excellent grove within twelve months.

"That is the story of the rejuvenation of this grove. Eighteen months ago it was worthless. Today, as you say, it is one of the finest to be found anywhere. It is all due to intelligent soil analysis and to faithfully following out the instructions of treatment, fertilization and cultivation given by one who has made the study of soil chemistry his life work.

"I am thoroughly convinced that there are hundreds of unprofitable groves all over the citrus producing sections which could be turned into profitable investments by the simple application of similar methods. I do not mean that the same methods which brought life to my grove would do the same for other groves. But I do believe that there is a remedy for practically all of the unprofitable groves in the citrus belt. Thorough analysis by an expert soil chemist is the first requisite; and a faithful carrying out of his instructions is the second. Few are qualified to make the analysis, but any grower of ordinary intelligence can carry out the instructions after the analysis has been made."

(In the next number of this magazine I will write a second article dealing exclusively with a small part of Dr. Petersen's scientific work.)

Is not the marketing of Goldens and Russets important?

Whether your crop is mostly of the best or chiefly of the less desirable grades—

**Is not the marketing of
goldens and russets important?**

Considering the citrus industry of Florida as a whole and regarding the welfare of all growers of the state—

**Is not the marketing of
goldens and russets important?**

Because of the known fact that usually it is an easy matter to sell high-class fruit for good prices—

**Is not the marketing of
goldens and russets important?**

Because the average output of the citrus groves of the state now runs so largely to the lower grades—

**Is not the marketing of
goldens and russets important?**

Because of the preponderance of low grade grapefruit and oranges and the necessity for the development of markets that will absorb them—

**Is not the marketing of
goldens and russets important?**

Because of the extent to which the citrus industry depends for its prosperity upon satisfactory returns for ALL fruit that is good enough to eat—

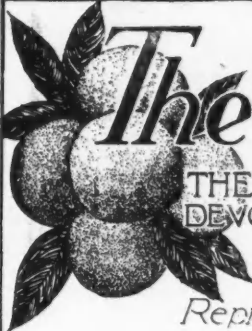
**Is not the marketing of
goldens and russets important?**

Is it not wise to avail yourself of the marketing advantages of ALL kinds of fruit offered to its members by the Florida Citrus Exchange which year after year returns them better prices, grade for grade, than can be secured through speculative selling channels? For information as to membership consult the manager of nearest association or sub-exchange, or write to the business manager at Tampa.



FLORIDA CITRUS EXCHANGE



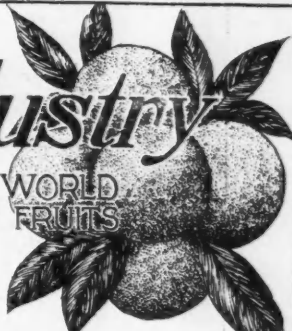


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No. 8

fruit-Bearing Hedge

The Carissa is an Ideal Hedge Plant

(By Dr. J. Petersen, Miami, Fla.)
(Copyrighted)



Dr. J. Petersen

Do you want a hedge impenetrable for two and four legged thieves? You can have this, and at the same time have a highly ornamental effect plus a plentiful supply of delicious fruit that combines in its taste, the best features of guavas, strawberries, and cranberries. Plant the Carissa, an ideal fruit bearing hedge plant.

Though their native home is in South Africa, they can be grown anywhere in southern Florida, from Key West to Titusville, on sand soils, on loam, marl or muck, provided the soil is well drained. Most modest in their requirements, Carissa need little attention, once they have been planted.

Seed can easily be secured from a bearing hedge and should be sown in a seed bed containing fairly rich soil. If kept moist but not wet, the seeds germinate in about two weeks and when about five inches high, the plants are ready to be transplanted.

For hedge purposes the young plants should be set alternately, in



Carissa in Bloom, Showing Thorn

two or three parallel rows, laid out a foot apart from each other; the distance between the rows should be one foot apart. If planted in limited space one row is sufficient.

When the plants are about a foot high, the first trimming is applied, which causes them to develop numerous branches near the ground soon making an impenetrable, compact



barrier. Any desired shape of hedge may be obtained by trimming properly and the oftener shearing is done, the thicker the plants interweave

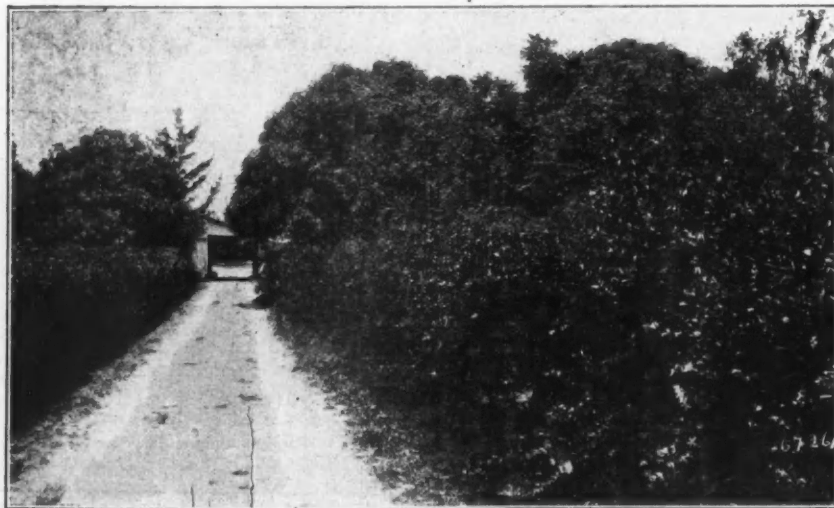
The Carissa has a beautiful foliage of dark green glossy leaves, and bears fragrant, star shaped, snow white flowers, that show strongly

assistant and modest in their food requirements, the Carissa will respond quickly to a liberal supply of water and fertilizer. The Carissa blooms most profusely in February and March, but well kept plants will produce some flowers throughout the year. The main crop ripens in August and it is a decided advantage that picking need not be done at a certain date, since the fruit may remain on the plant, for some time after it has ripened.

The brilliant red fruit is of elliptical form, as large as a good sized plum, with a sharp point at the upper end and its thin skin encloses, pink color, granular pulp, with a milky juice of sweet flavor. The ripened fruit analyses 12 per cent sugar, and may be eaten raw or preserved.

Stewed, it yields a compot, resembling cranberry sauce. Sliced and served with milk or cream, Carissas taste as good as strawberries, and can be used in fruit salads, as well. Its abundant acid, a plentiful supply of pectus and the bright cherry red color, render the Carissa an excellent jelly maker. Another advantage in the use of this fruit is that comparatively very little sugar is used in making it into jelly or marmalade, which leaves very little waste matter. Carissas may also be used to make a delicious drink.

Sumed up: Carissas make an inexpensive, efficient fruit bearing hedge. The evergreen leaves, the



their through branches, bearing numerous sharp pointed thorns. If allowed to grow, the Carissa will develop into a large shrub, attaining a height of fifteen feet or more.

against its foliage.

A good sized hedge may be developed within a year after planting, and during the second year the plants begin to fruit. Although drought re-

quiescent like flowers and the brilliant red fruit, offer a desirable attraction for our South Florida homes.

WHY NOT PLANT SOME CARISSAS?

Standard Growers Exchange to Sell Through Florida Citrus Exchange

An announcement of the greatest interest to Florida citrus interests was made recently when it became known that the Standard Growers Exchange of Orlando had perfected arrangements to hereafter market its fruit through the selling agency of the Florida Citrus Exchange.

The Standard Growers Exchange owns several thousand acres of groves in Florida and in addition has been an active and aggressive factor in handling the fruit of other growers, paying particular attention to the buying of fruit on the tree. This fruit has been packed in the houses of the Standard Growers Exchange and sold through its sales department. Under the new arrangement with the Florida Citrus Exchange, it is understood that the Standard Growers Exchange will continue its activities in buying fruit on the trees and preparing it for market. The actual selling of the fruit, however, will be handled by the Florida Citrus Exchange through its selling department.

Just what disposition will be made of the numerous packing plants of the Standard Growers Exchange, particularly where the houses of this concern and those of the Florida Citrus Exchange occupy identical fields, has not been made known. It is probable, however, that some of these plants will be continued in their present location, while in the case of others, the machinery at least may be moved to new locations.

The formal announcement of the arrangement whereby the Florida Citrus Exchange takes over the selling end of the Standard Growers Exchange business follows:

The most far-reaching news item in citrus circles since the industry has assumed importance in the state is confirmation by officers of the Florida Citrus Exchange of the fact that the Standard Growers Exchange with headquarters in Orlando will hereafter market its fruit solely through the co-operative organization of the Florida Citrus Exchange.

The Standard has been the second largest factor in the Florida citrus world, being exceeded only by the big co-operative organization in the volume of citrus fruits handled. It has maintained packing houses in Orlando, Fullers, Tampa, Crescent City, Eustis, Frostproof, Bowling Green,

Eagle Lake, Cocoa, Ft. Pierce, Naranja, Bradentown, Arcadia and Fort Myers. Fruit from its holdings of its own, together with that from other growers in the vicinity of these packing houses shipped by the Standard organization last season was considerably in excess of a million boxes.

Fruit from the groves of Joseph Di Giorgio, the Gentile Brothers, the Standard and other fruit handled by the organization, hereafter will be marketed through the Florida Citrus Exchange by the owners who join in the membership of that organization. These holdings are very large and consist of excellent bearing properties together with a considerable acreage of young groves.

Under the new arrangement it is expected the Standard Growers Exchange will expand its business considerably as the enlarged selling facilities of the Florida Citrus Exchange are made available to it. The Standard already has a heavy tonnage under contract for next season.

The Standard Growers Exchange will continue its headquarters and general offices in Orlando and the citrus selling arrangement with the Florida Citrus Exchange will not affect the Standard's business in Florida vegetables, Georgia peaches, etc., in which they are very large operators.

The Standard Growers Exchange has been known as such for about three years, previously having been H. C. Schrader & Co., the business having been originated by H. C. Schrader. The DiGiorgio interests, operating in fruits all over the country, were originally interested with Mr. Schrader. Later, with his retirement, they took over and operated the business with Joseph Trombetta as general manager. Mr. Trombetta at present is in Europe looking over the market possibilities there for Florida fruits, having retired from the management of the Standard some months ago. Lawrence and Joseph Gentile and V. B. Newton more recently have been in charge of the Standard operations in Florida.

The Florida Citrus Exchange through its local associations now controls approximately 120 packing houses in the various citrus areas of the Florida peninsula, and maintains approximately the same number of selling offices in the United States

and Canada. It is a purely co-operative selling organization of Florida growers founded in 1908, and operated to sell the fruit of its members at cost.

During the last season it is reported to have handled slightly more than one-third of the citrus crop of the state. With the accretion of the Standard holdings, and a dozen new local associations formed recently which will ship through the Exchange next fall, it is expected that its proportion of the crop will be increased considerably. During more than twelve years of operations the co-operative organization has shown gradual but steady growth until now it is claimed its members include a majority of growers in the state. However, large holdings by a relatively few big growers and organizations outside the Exchange are said to have kept down its percentage of the crop handled.

The Standard Growers Exchange, a commercial organization without any co-operative features, is the first of such large outside organizations to enter the ranks of the Florida Citrus Exchange, but the officials of the latter organization are said to be hopeful that as time passes more such organizations and large growers may be induced to do so by the obvious advantages to the industry of having a large volume of fruit under the control of a single selling agency.

Joseph Di Giorgio is a large citrus operator and grove owner in both Florida and California, being in addition heavily interested in deciduous fruits and a large stockholder in the biggest fruit auction markets in the country. He is one of the outstanding figures in fruit circles in the world, and together with his associates is one of the biggest factors in the fruit industry in the United States. Their intention hereafter to sell their citrus fruit from Florida solely through the Florida Citrus Exchange is said by citrus men here to be a strong testimonial of their regard for the efficiency of the Florida Citrus Exchange.

A few dollars spent in making the crib air-tight and for purchasing carbon bisulphide will save a few hundred dollars in corn from hungry weevils this winter and next spring. Try it.

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AN IMPORTANT ANNOUNCEMENT

The announcement recently made that the Standard Growers Exchange of Orlando will hereafter market its fruit through the Florida Citrus Exchange, is one which has attracted wide attention and which is of great interest throughout the citrus world.

The Standard Growers Exchange has been one of the leading factors in the production, packing and marketing of Florida citrus fruits, and has ranked with the greatest of the independent fruit shippers of the state. The decision to market its product and the fruits which it may purchase through the Florida Citrus Exchange, therefore, is a matter of intense interest to all citrus factors.

It is understood that the Standard Growers Exchange will continue its ownership of Florida groves and also will continue in the buying field, paying particular attention to the purchase of fruit on the trees. Its marketing, however, will be handled through the Florida Citrus Exchange.

The Standard Growers Exchange has been credited with handling approximately one and one-half million boxes of Florida citrus fruits annually, and the addition of its product to the already large volume handled by the Florida Citrus Exchange will materially strengthen the latter organization.

REVISING SPRAYING BULLETIN

MR. W. W. YOTHERS, government entomologist at Orlando, writes The Citrus Industry that he is about to revise Farmers' Bulletin No. 933, "Spraying for the Control of Insects and Mites Attacking Citrus Trees in Florida."

This is one of the most important bulletins for citrus growers issued by the department of agriculture, and it is the desire of Mr. Yothers to make it as complete and comprehensive as possible.

To this end he is asking suggestions from growers and others interested in the development of the industry to its highest possibilities.

The department and its agents are doing all in their power to aid the citrus growers in the solution of their problems and they deserve every possible co-operation and support which the grower and allied interests can give.

Many citrus growers find that they can profitably combine the culture of other semi-tropical fruits with the production of citrus fruits without neglecting or in

any manner injuring their main line.

PROPER GRADING ESSENTIAL

THE CITRUS INDUSTRY has had much to say in the past of the necessity for proper packing and grading of citrus fruits. It will have more to say in the future.

We believe that the difference between operating a citrus grove at a profit and operating it at a loss is frequently represented by the care, or lack of care, with which fruit is packed and graded.

To assume that Florida grows the best oranges in the world, and that the rest of the country will take notice of the fact, regardless of whether the boxes contain a few culls or unripe fruit, is to underrate the competition of other citrus-growing sections and the intelligence of the discriminating ultimate consumer.

Florida fruit, at its best, is supreme. But Florida grows a great deal of fruit that is fit only for pulp or juice production. And northern buyers will certainly estimate the general quality of our fruit by the worst samples they get, rather than by the best. And why shouldn't they? It is unreasonable to expect them to pay cheerfully for a green orange grown in Florida just because the state can produce good ones.

In the final analysis, the buyer is going to buy what he considers the best, and in reaching his judgment, he will be controlled largely by the matter of appearance. The fruit must taste good, to be sure. But first, it must LOOK good. It must be properly fertilized and properly sprayed to give it the "fancy" appearance which the buyer demands, and it must be carefully and properly graded and packed to insure uniformity in the box or shipment. Haphazard, hit-or-miss methods will not do—not if the grower hopes to receive a fair profit from his labor and investment, nor if the state as a whole hopes to retain its reputation for the production of superior fruits.

Many growers and most of the marketing agencies realize this fact, and for the most part they are working toward this end. But until every individual grower realizes that he himself is a loser by every unripe, unclean, undersized or off-color fruit which goes to the northern markets, the state and the growers of the state must continue to suffer.

Florida must improve its record of one-third of 1 per cent fancy grades in the northern markets before it can hope to convince the world that Florida fruits are superior to all others.

THE CARISSA HEDGE

NUMEROUS complaints were made last year by grove owners who reside in the North that, during their absence, thieves had entered their groves and stripped it of fruit. The thieves seemed particularly fond of King oranges and tangerines. We will admit that their taste is good, but residents of the North are not keeping groves in the South for the benefit of thieves.

Dr. J. Petersen, the noted soil chemist, has just written an article for the benefit of victims, wherein he again evidences his broad knowledge of matters pertaining to agriculture, but which also hints of his ability as a combatant of crime.

In his article, "Carissa Hedges," the doctor advises grove owners to plant this hedge and in doing so they will enjoy triple benefits: 1, its beauty; 2, its delicious fruit; 3, when the gates are locked the hedge will act as a sentinel on duty 24 hours a day, that will let no intruder pass, without considerable trouble and at his danger of being detected in the act of crime.

Tear Stain of Citrus fruits

By John R. Winston, Pathologist, Office of
Fruit Disease Investigation.

Florida citrus fruits are subject to two distinct types of tear streaking, namely, wither-tip tear-stain and melanose tear-streak. The former has been attributed to *Colletotrichum gleosporioides*, the wither-tip fungus, Penz., while the latter, which will not be discussed in this paper, is doubtless due to a peculiar distribution of the spores of the causal organism (*Phomopsis citri* Fawcett) the melanose and stem end rot fungus, in trickling waters.

Wither-tip tear-stain is a smooth, more or less brownish discoloration of the surface which occurs typically in fingerlike patterns about one-fourth of an inch in width, extending longitudinally toward the stylar or blossom end of the fruit. These streaks may or may not be confined to one side of the fruit, and frequently they appear to arise in areas russeted by rust mites (*Eriophyes oleiveros* Ashmead). The streaks are usually few in number, seldom more than six or eight; occasionally two or more merge and form a rather wide discoloration, in which event the injury is generally attributed to rust mites.

Wither-tip tear-stain as it occurs in Florida is one of the minor diseases of citrus fruits; and for that reason it has received little attention from investigators. Its effects are principally observed on the round orange and grapefruit, more noticeably and frequently on the latter and to a less extent upon other economic species of citrus.

The economic importance of this blemish is chiefly due to the financial loss which the grower sustains as a result of the lowered market value of the affected fruit, which is rendered unsightly and unattractive. However, tear-stained fruit seems to possess flavor and keeping qualities essentially equal to fruit which is free from these markings.

SPRAYING EXPERIMENTS.

During the season of 1917, in connection with spraying experiments which were conducted in a bearing grapefruit grove for the control of citrus scab, it was observed that tear staining was almost entirely absent from those plats that received several applications of lime-sulphur solution, though it was quite prevalent where Bordeaux mixture had been ap-

plied during the scab-spraying season. Since this first observation, many similar manifestations of the lack of control of tear-stain by copper sprays have appeared in the experimental plats. Such a failure has been proportional to the severity of rust-mite attack.

Ordinarily the scab-spraying season in Florida begins in February when the spring growth starts and extends over a period of two or three months. It is followed rather closely by the period of very severe attack by rust mites. The latter are usually most abundant during May and June and are readily controlled by two or three applications of lime-sulphur solution diluted 1 to 66.

In general, the results of this spraying experiment show (1) that tear-stain was controlled on plats 3 and 5, which received applications of lime-sulphur solution shortly before the period of maximum abundance of rust mites; (2) that tear-stain was materially reduced on plat 4, which received applications of lime-sulphur solution considerably in advance of the period of maximum numbers of rust mites; (3) that tear-stain was not reduced on plats 1 and 2, which received spray applications of copper mixtures. Assuming that tear-stain is caused by a species of *Colletotrichum* or other fungus, it would be reasonable to expect that plats 1 and 2 would show at least as good control as plat 4. The fact that control of tear-stain was so closely associated with rust-mite control is strong evidence that rust mites might be largely concerned in the causation of the condition that is generally recognized as wither-tip tear-stain.

A part of a grove of grapefruit was sprayed experimentally in June, 1919, using 3-4-50 Bordeaux mixture for plat 1 and 1-66 lime-sulphur solution for plat 2. Plat 3 was an unsprayed check. This grove had not been sprayed previously that season. At the end of July the fruit in plat 2 was free from tear staining, but numerous tear-stained specimens were observed in plats 1 and 3. The fruit on these plats ripened and was harvested in February, 1920, with no increase of tear-stain over that observed in July, 1919. This indicates that one application of weak lime-sulphur solution applied at a time

suitable for rust-mite control in that grove was equally effective for the control of tear-stain, while the standard strength of Bordeaux mixture applied at the same time did not reduce this blemish.

Other experimental data obtained during the past four years show without exception similar results.

The conclusion of Yothers (11), based on numerous extensive experiments to control rust mites in various parts of Florida, is that bright fruit—i. e., fruit free from rust-mite injury—is invariably free from tear-stain as well.

Growers generally throughout the Florida citrus belt have accomplished commercial control of tear-stain whenever they have controlled rust mites by following the spraying schedules established for these pests.

Definite observations in commercial groves show clearly the following facts: (1) Where rust mites are naturally absent tear-stain is not observed; (2) where rust mites occur and are successfully controlled tear-stain is also controlled; (3) where rust mites are present and are not controlled tear-stain occurs and usually varies proportionately with the severity of the rust-mite attack; (4) rust-mite russet and wither-tip tear-stain develop simultaneously.

Usually in Florida a small proportion of late citrus blooms occur in June. Fruits from such blooms develop after the normal rust-mite period and almost invariably ripen free from tear staining unless rust mites happen to become abundant during the following winter or early-spring months.

CULTURAL WORK

Fungi are admittedly capable of producing tear-streak patterns on the host; for example, *Phomopsis citri* is known definitely to produce melanose injury in distinct tear streaks on various citrus fruits. Consequently a careful study was made to determine the frequency of the occurrence of *Colletotrichum gleosporioides* or other fungi in typical wither-tip-tear-stain areas.

In preliminary tests made during the fall of 1918 oranges and grapefruit were selected that showed typical wither-tip tear-stain, as well as fruit affected with rust-mite russet which shaded off into tear-stain.

Eight

Usually 30 cultures were made from each fruit, 10 each from areas selected as follows: (1) Typical rust-mite russet, (2) typical tear-stained streaks or slightly discolored areas on fruits showing no streaking, and (3) normal areas not discolored. The fruits were washed 1 minute in 1-1,000 mercuric-chlorid solution and afterwards thoroughly rinsed in sterile water. Bits of tissue were then removed with flamed instruments to sterile Petri dishes and covered with melted corn-meal agar. These cultures were allowed to grow five days at room temperature. The results of this preliminary culture test are found in Table below, the percentages being based on the number of the bits of tissue used in each test.

Culture tests for the isolation of *Colletotrichum gloeosporioides* from normal and affected parts of orange and grapefruit rind.

Series	Number of fruits	Bits of tissue cultured	<i>Colletotrichum gloeosporioides</i>	Miscellaneous organisms	No growth
A. Russeted	17	170	38.2	18.8	43.0
B. Tear-stained	16	160	21.1	19.3	59.6
C. Normal	19	190	6.2	15.7	78.1

ent lots of fruits, but seems to be more abundant where the visible effects are most pronounced. A saprophytic type of *Cladosporium* is isolated with the same constancy as *Colletotrichum gloeosporioides*, but with less frequency. These extensive culture tests show, therefore, that it would be about as reasonable to ascribe the blemishes to one of these organisms as to the other, if constancy of isolation from lesions is to be the deciding consideration. However, neither fungus reaches a frequency of occurrence high enough to justify holding it to be the causative organism on this evidence alone.

Certain fruits having the melanose type of tear-streak were selected, and cultures were made from these in the manner already described, comparative tests being made from unblemished areas, from melanose tear-streak, and from diffused melanose areas; and cultures from the surface blemish known as "shark skin" were also made. The results are given in the following table:

Isolation of *Colletotrichum gloeosporioides*, *Cladosporium* sp., and miscellaneous organisms from orange

THE CITRUS INDUSTRY

It thus appears that *Colletotrichum gloeosporioides* is recovered in rather low percentage from tear-streaked areas, that it is present to some extent in normal as well as badly russeted areas, and that the frequency of occurrence varies directly with the degree of injury.

In the fall of 1919 a more extensive test was conducted. Fifteen lots of fruit were involved. Five of these lots were selected by the writer, and the remaining ten lots were selected in various parts of Florida by persons specially chosen for their competence to select typical rust-mite injury and typical wither-tip tear-stain. Each of these lots was sorted into several groups of one to four fruits each according to the variety of fruit, the particular type of effect, and the intensity of it. For a comparative study, cultures were made from fruits in the same lot that were free from blemishes or from un-

blemished areas on the russeted or tear-stained fruits. One hundred bits of tissue, approximately 1 square millimeter in surface area, were cultured from each test area of each fruit, using 10 Petri dishes, each with 10 bits of tissue. The results when reduced to a percentage basis, also represent the average numbers of occurrence per fruit. Corn-meal agar was used as a culture medium and the plates were held six days at room temperature. Counts were made of the common saprophytic type of *Cladosporium* as well as of *Colletotrichum* colonies. Bacteria and fungi other than these were reckoned as miscellaneous. Two parallel series were made, one for undisinfected tissue and one from similar areas on the same fruits washed with a disinfectant. Bichlorid of mercury solution (1 to 1,000) was used for 1 minute with subsequent rinsing on all disinfected lots except K, L, and M; on these three lots undiluted fresh hydrogen peroxid was used without rinsing.

Colletotrichum gloeosporioides is practically universally distributed on citrus-fruit surfaces and that it escapes to a considerable degree the surface disinfection process ordinarily practiced in culture work. It is present about equally on the average in tear-stained and russeted areas. The amount varies in differ-

and grapefruit rind affected with melanose or with "shark skin."

Lot and number of fruits in group	Variety	Remarks	Series A, diffused patches			Series B, tear-streak pattern			Series C, unblemished.		
			<i>Colletotrichum gloeosporioides</i>	<i>Cladosporium</i>	Miscellaneous	<i>Colletotrichum gloeosporioides</i>	<i>Cladosporium</i>	Miscellaneous	<i>Colletotrichum gloeosporioides</i>	<i>Cladosporium</i>	Miscellaneous
Not disinfected											
Lot E, 4 fruits	Grapefruit	Melanose tear-streaks	...	...	...	40	41	51	...	...	...
Do..	do.	Bright area on melanose fruits	...	...	...	...	...	...	27	23	40
Lot G, 2 fruits	do.	Melanose tear-streaks	...	...	...	8	11	45	12	5	15
Lot L, 2 fruits	do.	do.	...	...	...	5	2	1	...	...	...
Lot N, 1 fruit	do.	Mud-caked melanose..	32	19	67	...	...	...	...	...	...
Lot J, 4 fruits	Orange..	Decided "shark-skin"	31	17	49	...	...	...	...	...	...
Lot K, 4 fruits	Grapefruit	do.	25	15	11	...	...	...	...	...	...
Disinfected											
Lot E, 4 fruits	do.	Melanose tearstreaks.	...	...	...	5	1	.3	...	...	...
Do..	do.	Bright area on melanose fruits	...	...	...	...	...	...	.7	.5	.3
Lot G, 2 fruits	do.	Melanose tear-streaks	...	...	...	36	7	3	6.5	2	2
Lot L, 2 fruits	do.	do.	...	...	...	5	3	1	...	...	...
Lot N, 1 fruit	do.	Mud-caked melanose..	8.5	2	1	...	...	...	...	...	...
Lot J, 4 fruits	Orange..	Decided "shark-skin".	6	1	1	...	...	...	...	...	...
Lot K, 4 fruits	Grapefruit	do.	10	9.7	3.5	...	...	...	...	...	...

All the cultural work shows that no positive conclusion as to the causation of tear-stain can be rea-

sonably based on isolation tests.

All the cultural work shows that *Colletotrichum gloeosporioides* has

an isolation percentage from tear-stained areas rather too low for it to be the active pathogen and that this organism is present to some extent on normal as well as badly russeted areas, the frequency varying with the degree of injury.

The fungi in various types of miscellaneous lesions on citrus fruits were examined by similar cultural methods. These lesions included spray-burn scars, hail bruises, thorn scratches, and old citrus-scab lesions. The fungous flora was very similar to that obtained from tear-stained and russeted areas. Colonies of *Colletotrichum* predominated, the saprophytic *Cladosporium* ranked next, while colonies of bacteria and various other fungi occurred in smaller numbers.

To the unaided eye, rust-mite russet with its several patterns and the so-called wither-tip russet or tear-stain intergrade imperceptibly. Ordinarily the grower calls the streak tear-stain and the solid area rust-mite russet.

It was deemed important to make careful microscopic examinations to determine whether distinctive features exist in the rind tissue of the affected parts. Fruits were examined showing typical patterns of rust-mite russet as well as those showing several degrees of the so-called wither-tip tear-stain. Under the microscope there appears to be no material difference between these types of injury. The examination of the injured parts in both instances indicates that the cuticle and epidermal cells appear to be punctured, and beneath, depending upon the degree of russetting, one to three layers of cells, together with their contents, are of a rusty brown color. Quite frequently mycelial threads and spores of fungi prove to be the types commonly found on citrus, such as species of *Colletotrichum* and *Cladosporium*.

The histological examinations have not revealed any feature that would serve to distinguish between the rust-mite russet and the so-called wither-tip tear-stain.

The presence of punctures in the epidermal cells of the tear-stained areas would strongly suggest the work of sucking parasites rather than that of parasitic fungi. This suggestion is further substantiated by the following observation: In July, 1919, by the aid of a hand lens, numerous tear-stained immature grapefruits were examined while still hanging on the tree in an unsprayed grove near Orlando, Fla. The rust mites and their castings were more or less gen-

erally distributed over the fruits, but were present in especially large numbers over the tear-stained areas. This condition was very noticeable early in July. By August 2 such a marked segregation of mites in streaks was not particularly evident, and the mites themselves, as well as their castings, were nowhere present in very large numbers, but the tear stains, presumably caused by rust mites were quite evident.

An inoculation experiment was conducted last week in June, 1919, on immature grapefruits which were about 2 inches in diameter and so far as could be determined free from blemishes. Fifty fruits were used in this experiment. The inoculation was derived in part from dead sweet-orange twigs which had been held in moist chambers and on which developed a copious growth of the wither-tip fungus and in part from pure cultures of *Colletotrichum gloeosporioides*, which had been isolated from an injured grapefruit leaf. The spores were washed off the twigs and mixed with those from the culture tubes. This wash water, which was clouded with fresh viable spores, was used in saturating wads of absorbent cotton, which in turn were placed on the fruit. The inoculated fruit was covered with two or three layers of waxed paper for 48 hours. At the expiration of this time the paper and wet cotton were removed and the fruit left unprotected. To serve the purpose of a control, other fruits were similarly treated, except that the cotton was wetted with sterile water. These inoculations gave negative results.

Similar inoculation tests were made during the fall of 1919, using as inoculum a mixture of a number of strains of *Colletotrichum gloeosporioides* isolated from typical tear stains on grapefruit and from dead grapefruit twigs, as follows:

On October 20, 1919, on almost fully grown grapefruit; on October 27, on grapefruit showing faint yellowing; on November, 7, on grapefruit approximately one-half colored; on November 15, on grapefruit almost fully colored; and December 3, on mature grapefruit. This test was repeated during the late spring, summer and fall of 1920, using mixed inoculum from the same strains of *Colletotrichum gloeosporioides*. Inoculations were made on May 15, on grapefruit averaging 1 inch in diameter; on May 31, on grapefruit averaging 1 1/4 inches in diameter; on June 15, on grapefruit averaging 1 1/2 inches in diameter; on June 30, on

grapefruit averaging 2 1-16 inches in diameter; on July 15, on grapefruit averaging 2 1/2 inches in diameter; on July 30, on grapefruit averaging 3 inches in diameter; and on November 1 and 6, on grapefruit just beginning to color.

The results of all these tests were negative. Not the slightest symptom of tear-stain in any of the fruits inoculated during 1919 could be detected as late as February, 1920, when the crop was harvested. The fruit inoculated during 1920 was free from tear-stain when final observations were made in November.

Observations were made to determine the frequency of association of tear-stain with dead twigs that might harbor *Colletotrichum* or other fungi. Unsprayed groves with more than the average proportion of dead wood present were examined carefully during the past four years. Among the properties inspected in Florida 4 are in Lee County, 10 in Polk County, 2 in Hillsboro County, 3 in Pinellas County, 3 in Osceola County, 10 in Orange County, 2 in Volusia County, 4 in Brevard County, 3 in St. Lucie County, and 4 in Dade County. The data obtained indicate that dead twigs, spurs, etc., are found immediately over not more than 10 per cent of the tear-stained fruit, and that in damp, densely shaded, low-hammock properties, where trees have an unusually large number of dead twigs and where environmental factors would appear to be especially favorable for the development of fungi, tear-stained fruits are very seldom found. On the other hand, tear-stain is most abundant in higher and drier locations where light and moisture favor the greatest rust-mite development.

While the foregoing evidence is to the effect that tear staining of Florida citrus fruits is caused by rust mites rather than by the fungus *Colletotrichum gloeosporioides*, as claimed by Rolfs, it must be admitted that the writer may not have seen all types of this injury. However, if a special type of tear staining caused by this fungus occurs in Florida it must have been exceedingly rare during the past four years to have escaped detection by the writer. The experimental and observational data on the control of what has been regarded as wither-tip tear-stain by investigators and Florida growers seems to be definite enough to warrant the conclusion that practically all of the so-called wither-tip tear-stain in Florida is caused by rust mites and can be readily controlled by controlling these pests.

Toll Taken by Shade Trees

J. G. Grossenbacher in Citrus Leaf No. 9.

Shade trees are valued both for the beauty and comfort they add to a locality. They are of special importance in a warm climate like that of Florida with its high percentage of sunny days. In conformity with these climatic conditions, Florida is blessed with many native as well as introduced evergreen trees that are rapid growers and suitable for making shade-tree plantings. The residential sections of cities and towns not only require trees to add beauty in giving proper settings for houses and other buildings but to give shade that is practically of as much importance to a home as a roof. Trees along highways are also of great value in improving the appearance of landscapes and affording cool shade to travelers.

Altho many communities in the state planted shade trees both in towns and along country roads, it seems likely that the next few years will see much more activity along these lines. The many miles of hard surfaced roads built during the past few years, along with those to be built in the next few years, will afford unusual opportunity for sane tree planting to provide comforts and beauty for the future.

In the citrus section of Florida, most of the older plantings of shade trees consist of water oak. These are particularly in evidence in Volusia, Lake, and Orange counties. These plantings were all made before the 1896 freeze and the trees are now very large and most beautiful. In more recent years the lower east coast counties, Dade, Broward, and Palm Beach counties, took up tree setting along the main highways. The Australian Pine was used almost exclusively. These trees now look very attractive but owing to their extreme sensitiveness to fire damage the rows are no longer continuous. Hundreds of them have been killed by fire during the past three years. The Eucalyptus is also being used as a way-side tree in recent years with fair success in Central Florida.

The Australian Pine and Eucalyptus do not appear to be injurious to grove trees along the highways but the water oaks have proved very harmful in that respect. The damage by water oaks to grove trees along the highways appears to be in proportion to the sterility of the land. In flatwoods where there is good grove drainage but no lack of

water the amount of injury sustained by grove trees from shade trees along the road is not very marked, but in sections of thin high-pine land, water-oak shade trees along the highways do much damage. There appears to be no doubt that these trees in fairly dense rows on highways where groves occur on both sides practically eliminate two rows of grove trees on both sides of the highway.

Assuming a case where such conditions occur along grove frontage one-quarter mile long, the annual damage may be reckoned as follows: If trees are set 25x25 feet there are 208 trees loss, and if the groves are of three box capacity per tree the loss amounts to 624 boxes per year; while if the trees are set 15x30 feet, the loss in trees is 348, or 1044 boxes of oranges per year. This shows that it does not pay to grow the water oaks for shade trees alongside of groves.

The usual practice to reduce the damage by harmful shade trees is to dig a ditch along the edge of the groves and thus cut the roots of the shade trees. That also cuts the roots

of citrus trees that may go beyond the grove line; besides unless the ditch is 4 to 6 feet deep it does not cut all the shade tree roots that are robbing the groves.

Early last spring I cut the roots close to the base of such a shade tree just as though the tree were to be dug a ditch along the edge of the grove on the side toward the grove. The hole was left open to watch results. This tree made normal growth and looks normal now in every way. It seems that the removal of all roots entering the grove has not harmed the tree in any way. About the middle of May a considerable number of water oaks and long needled pines along a grove were given the same treatment. From one to two feet of the base of all roots going grove-ward at the butt of the trees, were cut out and removed down as far as any lateral roots could be found. It seems to me that this method of protecting fruit trees from the ravages of shade-tree roots not only costs less but that it is much more effective than the usual ditching, and at the same time cuts none of the grove-tree roots.

Citrus Plantings Tremendous

Demand for Budded Trees Greatly Exceeds the Supply

That the demand for budded citrus trees far exceeded the supply during the past year is made apparent by the falling off in the movement of budded trees and the great increase in the movement of propagating stock, reports the state nursery inspector.

The recorded movement of citrus plants for the past two years is here given in parallel columns for comparison:

	Year Ending April 30, 1920	Year Ending April 30, 1921
Oranges	1,458,293	1,118,255
Grapefruit	460,614	352,522
Tangerine	133,639	121,662
Satsumas	50,715	41,625
Total budded	2,103,261	1,700,064
Limes*	11,677	7,116
Lemons*	372,414	3,294,558
		S. O. S. 774,330
Others	97,421	Other S. 77,104
		Others 137,024
Total citrus moved	2,584,773	5,990,196

The astonishing increase in seedlings moved indicates clearly that the smaller number of budded trees moved last year was due to shortage of supply and not slackening in demand. The large numbers of rough lemon seedlings moved this year would seem to indicate much development in grove plantings on the higher sandy lands of the state.

*Budded and seedlings.

England Good Market

England eats oranges, also grapefruit, but they are not the products of Florida, says Col. E. A. Iremonger, acting British vice-consul in Tampa. The fruit sold in England comes from California, from South Africa, from Syria and Mediterranean points, yet British importers are ready and willing to take shipments from Florida and educate the British people to demand more Florida citrus fruit.

"In Leeds, one of the chief cities of England," said Col. Iremonger yesterday, "people are as familiar with California 'Sunkist' brand as they are the town clock, and they get fruit from Porto Rico, Jamaica and other parts of the world, but not from Florida."

He showed a letter which he received some time ago from one of the biggest fruit importers of Great Britain, with offices in various cities of the British Isles, Canada and the United States, which reads in part:

"I would be most willing to accept consignments of Florida oranges and grapefruit and to do my utmost to promote the objects which your friends have in view. I am well aware of the excellence of your fruit and as my firm represents in Europe the California Fruit Exchange, your friends will be able to judge that we are no tyros in the business.

"An occasional shipment of Florida oranges has been made with no bad results.

"The question of shipping direct as against using the regular liners is one that requires some consideration as it frequently happens that with slow and ill-ventilated steamers, perhaps at a lower freight than the large and swift vessels generally employed for carrying fruit, the result may be deterioration through delay and want of ventilation."

Colonel Iremonger also has letters from another big firm which he says is also keen on Florida shipments. He states that he would be glad to obtain further information and verification of the facts from England for anyone interested, without anyone risking a dollar.

Freight \$6 a Box

Shipping from Florida to New York by rail and thence by boat to Liverpool, he thinks the freight would be about \$6. Of course, if the fruit could be shipped by boat direct from Tampa, it would be much cheaper. The passage from Cape Town, South Africa, to England takes

eighteen days, and he thinks that if it pays to ship from there, or from California, it would pay still better from Florida.

Colonel Iremonger, who had been residing in America for some time, returned to England when the war began and, after coming to Tampa he was last year given the order of Commander of the British Empire by King George for his services as colonel of a regiment in the war. While still stationed in England after the war, he got in touch with the head of the importing firm mentioned above, whose nephew was an officer in his regiment. Since returning to the United States, he has been desirous of promoting citrus shipments to England. He says that it is desired to build up the trade, beginning with comparatively small shipments and increasing as the demand for the Florida variety grows.

Last season the American Fruit Growers, Inc., made some experimental shipments of grapefruit and oranges to England, and it is said that these shipments proved to be entirely successful. The fruit arrived in excellent condition and was highly prized by British consumers. It is probable that this same concern will make further shipments to European markets.

The last time he was in England, he says oranges retailed at twenty-two cents each, and grapefruit of inferior quality at thirty cents each.

Officials of the Florida Citrus Exchange have in the past made investigation of foreign markets and mapped out plans for agencies, salesmen, etc. Lately they have taken up the question of water shipments with the Mallory Line, coastwise, and the Tampa Inter-Ocean Steamship Company, foreign, but have not yet gotten replies. It is stated that the citrus exchange since the war has hesitated to venture upon foreign shipments especially on account of the unfavorable foreign exchange money rates which have prevailed for the last few years.

With soap so comparatively cheap, it's queer there are so many homes with squeaking doors and sticking bureau drawers.

With sugar down to reasonable prices, it behooves every housewife to preserve all the fruit she can get her hands on.

LAKE WALES PACKING COMPANY ORGANIZED

The Lake Wales Packing Co., has been organized with a capital stock of \$25,000 and notice is being given of intention to apply for Letters of Incorporation. Officers for the present are Dr. P. Farkner, Orlando, president; C. M. Bly, 1st vice-president; B. P. Kelly, Lake Wales, 2nd vice president; T. J. Parker, Lake Wales, treasurer; H. G. Wiggins, Orlando, secretary. The packing house manager has not yet been named, but an experienced man will be selected.

The company has secured a lot on the Coast Line railroad near the new plant of the Townsend Sash, Door and Blind Co., and will put up a building at once. The building will cover a space 80x100 feet, and will be able to pack from two to three cars of fruit a day. It will be so arranged that it can be added to as the need arises. Officers of the company say they hope to pack 100,000 boxes of fruit this season and they look ahead to the time within the next five years when it will take five or six packing houses of the capacity of this one and of the Exchange house now located here, to take care of the fruit that will be offered at this station.

"You will see the Coast Line running solid trains of citrus fruit out of this station," said B. P. Kelly, one of the local men who has been active in getting the new packing house.

It has been estimated that there is fully 20,000 acres of citrus plantings in sections tributary to this city, which will have to be handled here and the backers of the new house express a belief that they will get their share of it.

The Florida Citrus Exchange has a house here with a capacity of four cars or a little better per day, and plans to take care of greater business in the future.

Dr. Phillips, of Orlando, is probably the chief shipper of grapefruit in the state, outside of the Citrus Exchange, it is stated. He has long been an important factor in the citrus situation. Local interests have been active for some time in getting him interested at Lake Wales. T. J. Parker, B. P. Kelly, J. A. Curtis and others have been among those back of the new packing house.

A new silk dress isn't the only way to make a woman happy. One good way is to install a running water system or an electric light system in the house, especially in the kitchen. Try it.

Greater Care Necessary in Making Up Fruit Shipping Crates

Important factors affecting the successful use of crates in marketing fruits and vegetables were carefully studied by a specialist of the bureau of markets, United States department of agriculture, during a recent trip through a part of the South, particularly the orange-producing region. The first of these is the need of manufacturers making a more rigid inspection of materials used.

While most manufacturers make an effort to have their stock inspected and to use only good material, in some cases this attempt is frustrated by the failure of the workmen to understand and appreciate the ideal which is guiding his employer. Many crate-mill employees seem to cherish the old idea that because the crate is a gift package it should be made as cheaply as possible, using any sort of material so long as there is a chance of its holding together, thus reducing the cost to the grower and shipper. Under present traffic conditions such method is the worst one to follow if the best interests of the grower, and therefore of the manufacturer, are to be considered. The manufacturer should endeavor to instill in his employees the importance of culling out inferior and defective material.

Attention should be given also to the work of the automatic nailing machines. These are not invariably accurate, nor is it always possible for the manufacturer to obtain the nails best adapted to successful operation of the machines. Consequently, in nailing panels to headsticks in the manufacture of panel-end crates some nails may be missed and inspection is necessary to cull out the defective pieces and put in the missing nails.

The crate manufacturer having done his part in providing materials free from defects, the grower or shipper should see to it that the crate is not spoiled in being made up in his packing house or field.

Growers and shippers should remember that the nailing together of the crate is one of the biggest factors in determining whether the container is to be strong and substantial or weak and productive of damage claims. Cement-coated nails not less than fourpenny in size should always be used and care should be taken to see that they are properly spaced and placed.

Greater care is perhaps necessary

in making up crates for express shipments than for carload freight shipments, due to the more frequent handling they must undergo. For either method of shipping consideration should be given to methods of construction which will lessen the possibility of loss. An instance of this is the use of the "web" or cleated side of celery crates. The slats are stapled to the cleats in the factory, making but one piece to each side to handle in the field instead of three. It also insures even spacing of the slats and gives an extra thickness for holding the nails, thus counteracting any tendency of the slats to split and come away from the nails.

Whatever the type of crate used, it is the duty of the manufacturer to supply good material, accurately cut and properly put together. This much the purchaser of crates should demand and should expect to pay for. Having secured it, he should do his part by seeing that the crates are made up in a workmanlike manner, and, after packing, that they are properly closed and fastened for shipment. By such co-operation manufacturers and growers can feel better assured that the crate will measure up to the ideal of a fruit and vegetable package; that it shall carry the commodity intact from the grower through the wholesale market to the retailer.

CITRUS GROWERS ARE ORGANIZED

A meeting of the Fort Lauderdale Citrus Growers Association was held in the Chamber of Commerce rooms at Fort Lauderdale, Friday, July 8, with an attendance of about twenty growers and visitors.

Business Manager Stewart of the Florida Citrus Exchange, Mr. Reed Curry, organizer for the Exchange, Sub-Exchange Manager Barnes of Miami, and the editor of the Hallandale Herald, were president to assist in the organization.

The meeting was presided over by Mr. O. S. Vaniman and Mr. Bruno Reinsch acted as secretary. Interesting and enlightening talks were made by Mr. Stewart and others on the plan of organization, the benefits of co-operation in growing, picking, packing and marketing fruit and the improvement in crops as the result of co-operative work.

On motion it was decided to organize and a committee to nominate five

directors was appointed. The committee presented the names of O. S. Vaniman, A. H. Brook, Reed A. Bryan, S. R. Johnson and Bruno Reinsch, and they were unanimously elected.

The matter of selecting a packing house to handle the fruit grown by the members between Boynton and Arch Creek was discussed at some length and the directors were instructed to obtain all the information possible on this subject and report at a meeting to be called for the purpose of deciding on a packing house.

Following the regular meeting of the association, a meeting of the directors was held and the following officers were elected for the ensuing year:

President—O. S. Vaniman.
Vice-President—S. R. Johnston.
Sec.-Treas.—Bruno Reinsch.

NEW PACKING HOUSE FOR LEE CO. ASSOCIATION

J. E. Mattern, manager of the Lee County Citrus Sub-Exchange, announces the purchase by the Leeco Citrus Growers' Association, of Fort Myers, of the packing house there owned and formerly operated by the Standard Growers' Exchange.

The packing house is a thoroughly modern one and well situated on both river and railroad. Both the house and the real estate are included in the deal.

The former packing house and equipment of the Leeco Association will be disposed of, and all business of the association handled from the new house next season. This will considerably enlarge the capacity of the local association of the co-operative organization, while provisions made when the house was constructed allow of doubling the present capacity by the installation of additional machinery at any time in the future when conditions justify it.

The Exchange men are looking forward to a considerable increase in the membership and volume of fruit handled by the Leeco Association next season, and will make every effort to be prepared for it.

Officers of the Leeco Citrus Growers' Association are: C. J. Stubbs, president; P. John Hart, secretary and treasurer, who, with Conrad Menge, Ernest Brecht, Dr. B. P. Matheson, N. L. Blount and Dr. Rasmussen, constitute the board of directors. C. J. Stubbs also is a member of the board of directors of the Florida Citrus Exchange, representing Lee county in that body.

Miami's Curb Market

By Geo. T. Tippin.

Among the many interesting things coming under my observation during a recent trip to Dade County, in the interest of the Citrus Industry, was the curb market in the city of Miami. As all market places in Florida have to do with the marketing of citrus fruits, and Miami especially, a short story of the beginning and the development of this market will be of interest to the readers of The Citrus Industry.

This market was started three years ago by Miss Lucy Cushman, Home Demonstration Agent, backed by the Woman's Club as a war measure. At that time only three farmers patronized the curb market. The people of Miami soon recognized what it meant to them to have the opportunity to go direct to the market and buy their fruits and vegetables first hand and the demand for such products increased rapidly until there are now fifty-five farmers and fruit growers who have their space at the market and sell their produce direct to the consumer.

The city government recognizing the importance of the market both to the farmers and consumers is doing everything it can to encourage the proposition.

Mr. J. S. Rainey, the County Farm Manager, is now one of the most active men in the further development of the market, and in doing this work he is combining the real business end of County Farm Management with the scientific producing end of it, in fact the most important, for what profiteth the grower if all is lost in the process of distribution and marketing.

Mr. Rainey with the co-operation of some far sighted men recently secured the use of a large shed from the city without cost, to be used as market square until a new market house can be built. An all year round market will be maintained where the consumer can buy fresh fruits and vegetables.

The high cost of living reduced by eliminating the cost of tin cans and packing charges, railroad rates and middle men's profits, and at the same time paying the grower a living price for his labor which he sells to them in the shape of necessary food products.

The city market at Miami means a great deal for the citrus growers of the county for the elimination of

middle profits will very materially increase consumption demand, and they will be able to market much more fruit in the city than ever before. Beside the winter visitors desiring to send special boxes to friends in the north will be pleased to avail themselves of the opportunity to make their own selections.

ANOTHER INSECT PEST THREATENS FLORIDA

Recently there has been discovered in New Orleans, La., a most serious insect pest attacking many ornamental and fruit trees. This insect is known as the Japanese Camphor scale. It has not heretofore been known to be in the United States and its discovery in New Orleans has occasioned much concern among horticulturists and officials whose duty is to protect the fruit growing interests of the country and several states.

The insect is one which attacks many trees and shrubs, over a hundred different plants now being known to be hosts. Shade trees, including the live oak, are attacked and citrus trees seem to be favorite food plants. The Louisiana authorities and the city officials of New Orleans appreciate the damage which this pest may do and are engaged in a vigorous attempt to control and, if possible, eradicate the insect in that part of the city where it has gained a foot-hold. It is believed that the Japanese Camphor scale was introduced into the city of New Orleans more than a year ago, possibly two years. It was only within the past six months, however, that the very serious nature of the situation was fully realized.

Having been advised of the possibility of this pest's being introduced into Florida on nursery stock or otherwise, the State Plant Board is exerting itself to prevent such a misfortune. Indeed, our assistant quarantine inspector, stationed at Pensacola intercepted last August, a shipment of Japanese-Camphor-scale-infested nursery stock from New Orleans consigned to one of Florida's largest nursery firms. This was our first intimation that the scale was in this country. The stock was immediately and safely disposed of.

ERADICATE CITRUS FOOT ROT

Do not be alarmed, if you find citrus foot rot in your grove. It can be

cured and the disease eliminated, says H. E. Stevens, formerly plant pathologist of the Florida Experiment Station, now county agent of Lee county.

Foot rot is confined to the crown and main roots of the trees and extends, from a foot or so above the ground, downward to slightly below the ground level.

Here is the simple method for its eradication, which has been found effective:

Remove the soil from about the crown roots as far back as the disease occurs, and cut the diseased material away. This can be recognized by a yellowish or dark coloration.

Apply an antiseptic wash; such as, crude carbolic acid one part, water one part, and avenarius carbolineum, dilute or full strength, one part.

Make examinations every month or two for a reappearance of the disease.

Paint the lower part of the trunk and crown with a paste of air-slaked lime and sulphur flour, equal parts, mixed with sufficient water to make a thin paste. Apply this to all the trees in that part of the grove where foot rot occurs. The lime-sulphur paint frequently prevents further spread of the disease, if the old infected spots are thoroughly cleaned and the diseased parts cut away before treating.

FLORIDA LOSES EXPERT

Again the Florida Experiment Station loses one of its most valuable scientific workers. Professor J. B. Thompson, grass and forage crops specialist, has gone to accept the directorship of the experiment station at St. Croix, Virgin Islands, at a greatly increased salary.

The Florida station is not able to compete with the St. Croix station for Professor Thompson's services. This is made so because the amount of money appropriated by the last legislature for the station's maintenance and work is so small, it is imperative that salaries be kept abnormally low.

Professor Thompson was engaged in forage crop and grass experiments at Gainesville from October 1, 1917, till his resignation, August 9, 1921. He has perhaps a wider knowledge of grasses adapted to Florida conditions than any other man in the country. His advice has been constantly sought by farmers and cattlemen, and his departure is a severe blow to one of the most important lines of investigation being conducted by the Florida station.

Plan to Ship Citrus fruits by Water

Definite movement toward the shipment of citrus fruits to northern markets by water was taken at a meeting of citrus growers and shippers held in Tampa at a recent date, when the entire proposition was thoroughly discussed and considered.

L. C. Edwards of Thonotosassa, member of the firm of Lee & Edwards, one of the heaviest growers and shippers of citrus fruits in the state, is a prime factor in the movement and he recently had a conference with Philip Shore, president of the Tampa Inter-Ocean Steamship company, to discuss the various aspects of the proposed water shipment.

"Mr. Shore told me," said Mr. Edwards, after the conference, "that his company could make money on transporting oranges from this port to New York, Philadelphia or Baltimore at 50 cents per box, provided, of course, sufficient quantity of fruit is offered to make cargoes at certain intervals so that the line could be kept in operation and thus insure the ships against idleness.

"He will agree to provide refrigeration and ventilation on his ships sufficient to insure against any except minimum loss, and I am convinced that we can put our fruit into the eastern markets, say through Philadelphia, which has municipal docks, at about half the freight cost we now pay for refrigerator services by all-rail.

Reship From Philadelphia

"Also, we can reship by rail from Philadelphia to the eastern cities, the west and middle west, and along the Atlantic seaboard, and paying the local rate on top of the water haul from Tampa, and get out at a far lower cost of transportation than we now pay.

"It costs approximately \$1.15 a box to lay a box of citrus fruits down in New York City all-rail from Tampa or a point near Tampa. I believe we can put them down on the dock at Philadelphia for not more than half that sum by using the water haul. California is doing it now—putting its oranges on the dock in New York, by ship from California ports, at a cost of about 70 cents per box. The haul is a very long one—down the Pacific coast to the Panama canal, then through the canal to the Atlantic ocean and up the coast to New York, through varying degrees of temperature. Yet they are reaching New York with only slight loss by de-

cay. Our haul from Tampa to New York, or Baltimore, or Philadelphia, would be about a fourth the distance of the California haul.

"Porto Rico lays its oranges on the New York docks at a cost of 25 cents per box, and Italy has its lemons placed there, after a haul across the wide Atlantic ocean, at less than 20 cents per box. It is time that we used what nature has given us—a short water haul to the principal points in the east, for our great citrus crop.

5,000,000 Boxes Available Here

"We might reasonably expect to get the greater part of 5,000,000 boxes produced in Hillsborough, Polk, Manatee and Pinellas counties for shipment by water from Tampa. Manatee county can load its fruit on barges and have it towed by water to Tampa. Much of the Pinellas crop can come in by water. Polk and Pinellas and Hillsborough all have splendid hard roads, and the fruit can come in on motor trucks to docksides, a quick haul and a cheap one. Also there is a possibility of getting a considerable portion of the Pasco and Hernando crops here by the same means. I will undertake to divert much fruit from Pasco county to the water haul from Tampa.

"Another thing. The Tampa Inter-Ocean company is largely Tampa-owned. The motor trucks which would be operated and the barge lines would be owned here or in the surrounding territory. We would hold our money at home, for home purposes, and go ahead with the building up of this port as well.

"We can reach the southwest by boat line through New Orleans or Mobile, or both, at cheap rates. I know that refrigeration on the steamers will provide perfect carrying. It's not a venture. As for diverting the fruit in transit to different markets, we can arrange that all right from the point of first destination. It is easy of accomplishment."

Mr. Edwards stated that "We have been paying top prices for transportation for years, and thereby robbing ourselves. It has come to a point where, unless the consumer pays a big price for fruit, we cannot get a profit because of the heaped up transportation cost," he said. "It is time to cease talking and begin to act. Here is the way out—through Tampa by water."

Works in Well With Jobbers' Plan

The plan to move a large volume

of fruit by water from this port would work in well with the movement recently inaugurated by the jobbing interests of Tampa to establish and support a line of steamers to some eastern port—Philadelphia, Baltimore or New York—to bring in the goods used in the wholesale trade out of Tampa, which is a large volume. This business has been threatened with extinction by announcement that the railroads will shortly place all points on an equal footing through the long and short haul clause of the transportation law. The fruit growers would provide outgoing cargoes for at least six months in the year, while the jobbers and other interests would provide the return cargo.

THE FIRST BIG FREEZE

The Lakeland Telegram has received from Congressman Drane the copy of an article published in Niles Register of July 26, 1836, one of the leading newspapers of the '30's, showing the results of the first big freeze which hit the orange industry of this state. The surprising thing about it is the fact that St. Augustine was then a great citrus center, with a two million dollar crop in prospect. This was in the winter of 1834-5, and about the time of the Dade Massacre, which occurred December 28, 1835. Following is the article:

"It is known to every one that during the severe frosts of the winter previous to the last, every orange grove was destroyed. It was believed by the orange growers in the city of St. Augustine alone that a receipt of \$2,000,000 would be the result of the crop of that city. A week previous to the frost which terminated so fatally a gentleman purchased four thousand young trees at 10c each for the purpose of removing and transplanting them in a distant city. These were placed in mats and preserved and are believed to be the only ones left in the territory. The purchaser, Mr. Butler, for his disbursement, \$400, was offered \$6,000, which was declined. This gentleman is since dead. Some of the trees have been since purchased, again removed to St. Augustine, and will probably in a few years become prolific."

A good growth of weeds may serve a useful purpose if turned under before the plants go to seed.

EXCHANGE SUPPLY COMPANY BUILDING BRICK DRY KILN

The Exchange Supply Company is constructing a brick dry kiln 160 feet long by 21 feet wide at its plan in the south part of Plant City. The brick walls, which will be seven feet high, are to be capped with a foot of iron work and to have a wooden roof. The kiln, it is estimated, will have a capacity of around 100,000 feet of lumber, but will be used to dry crate material.

Machinery has been installed in the company's recently completed packing house material factory, which will be ready to operate when the main plant resumes work sometime between August 15 and September 1. This addition to the plant was moved here from Tampa and will manufacture machinery for the packing houses of South Florida.

Six new houses for the employees have been completed and painted, and the six houses the company already had on the east side of Collins street have been repainted. Three of the new houses are located on the west side of Collins street and are now occupied. The remaining three new houses are on the east side of the street and will soon be ready for occupancy.

All of the company's twelve houses are painted a canary yellow, trimmed in white, and make a very attractive row in front of the plant. The new houses contain four and six rooms each, and three of them have sleeping porches. Three of the old houses are large and roomy two-story structures, while the other three of the old houses, though single-story buildings, have five or six rooms each.

FLORIDA STATION GETS ASSISTANT CHEMIST

The Agricultural Experiment Station, University of Florida, has employed J. M. Coleman as assistant chemist, beginning July 15.

Mr. Coleman is a graduate of the Mississippi A. & M. College, 1915, and has spent several years in chemical work with a number of concerns throughout the country. He is especially experienced in all phases of feed and soil analysis.

He will devote most of his time at the Florida station in studying the chemical end of the soft pork problem, as well as special phases of the dairying and livestock industry.

Nature furnishes us with pure air, but unless we breathe it freely, it profiteth us nothing.

THE CITRUS INDUSTRY

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The rate for advertisements of this nature is only three cents per word for each insertion. You may count the number of words you have, multiply it by three, and you will have the cost of the advertisement for one insertion. Multiply this by the total number of insertions desired and you will have the total cost. This rate is so low that we cannot charge classified accounts, and would, therefore, appreciate a remittance with order. No advertisement accepted for less than 50 cents.

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EARLY BEARING Papershell Pecan trees, budded or grafted and guaranteed. Great shortage this year. Write for catalog today. Bass Pecan Company, Lumberton, Miss.

Citrus Trifoliata Seedlings: 10-12 inches \$10.00 per thousand; 12-18 inches \$15.00 per thousand; 18-24 inches \$20.00 per thousand. Griffing Nurseries, Port Arthur, Texas.

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Make your own paints, varnishes, stains, turpentines, oil and shellac at one-half the dealers' price. Complete set of all these formulas for 35 cents. Wm. McDermott, 6521 South Justine St., Chicago, Ill.

GREAT BARGAINS in coon, Fox, Wolf, Skunkhounds, Collie and Shepherds. Puppies of all breeds. List, 10c. NORMAN CRAWFORD, Downing, Mo.

REAL ESTATE

LOOKING for Florida property for home or investment? Fruit, truck, poultry or stock farms? Orange groves, winter homes? Write Dr. Fellows, Newburyport, Mass. New England agent Crystal Lake Subdivision. Apr.—3t.

WANTED—To hear from owner of land for sale. O. K. Hawley, Baldwin, Wisconsin. It

INDIAN RIVER GROVES, river fronts, homes city lots for sale. We are reliable and give honest service. Have one five acres and five room house for \$1,000. Goodwin & Baker, Palmetto St., Fort Pierce, Fla.

WANT to hear from owner having farm for sale; give particulars and lowest price. John J. Black, Chippewa Falls, Wis. 9-21-3t

FOR SALE—Choice California citrus lands. One dollar per acre monthly. R. B. Davy, Hayward, Calif. Nov.—2t

For Sale—10 acres citrus land at Roseland, Indian river, \$50 per acre. Boon, 127 Gray Court, Birmingham, Mich.

IF YOU WANT to sell or exchange your property write me. JOHN J. BLACK, 180th St., Chippewa Falls, Wis. m-3t

Fifteen

FRUIT AND BERRY LANDS—What do you want to grow? How much land do you want and what terms? Railroad Farm Bureau, San Antonio, Tex.

CANE SEED—Early amber and orange. Fancy recleaned stock, \$2.50 per bushel. Red Top, \$2.60 per bushel. Hudmon Seed Company, Nashville, Tenn.

RABBITS

Read "RABBIT JOURNAL," St. Francis, Wis. Two years \$1 trial 25c. tt

POULTRY

BRED-TO-LAY SINGLE COMB RHODE Island Reds. Eggs, \$3 for 15. From selected colors. T. M. Montgomery, Starkville, Miss.

S. C. RHODE ISLAND RED EGGS of fine quality, 3, 4 and 5 dollars per 15. Prize winners. Miss Erma Louise Singleton, Box A, Dubard, Miss.

SEEDS

Wanted—Will pay highest cash price for Dasheens, Pigeon Peas, Mangoes, all other tropical fruit and produce. S. Rosen, 7 East 135th St., New York City. Aug. 1y.

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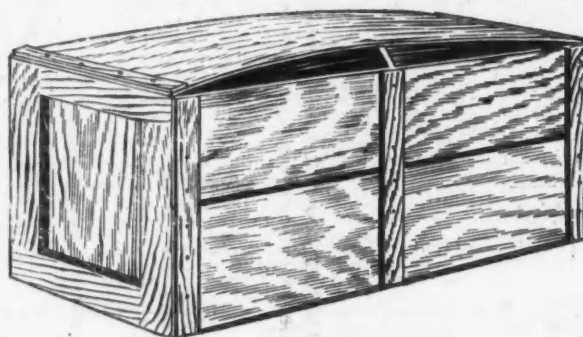
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